

REMARKS

Claims 2-14, 16-20, 22-40, 44-48 and 50-59 are pending in the application of which claims 7, 10, 12-14, 19, 22, 24-40, 48, 50-52 and 55 are withdrawn from consideration.

Claims 2, 3, 4, 5, 6, 8, 9, 11, 16, 17, 18, 20, 23, 44-47, 53, 54, 56-59 are under consideration.

Support for new Claim 60 may be found.

Claim rejection 35 U.S.C. § 102(b)

Claims 5, 6, 8, 9, 44, 46, 47, and 56 and 58 are rejected under 35 U.S.C. § 102(b) based on Tanioka.

Tanioka

The Office Action dated October 24, 2003 alleges that Tanioka discloses an unpackaged semiconductor die 2 (FIGS. 2A-2C) directly attached to the package module, the unpackaged semiconductor die encapsulated 16 (FIG. 2A) onto the package module in a structure having a planar top surface. The Office Action also alleges that, as illustrated in a drawing reproducing FIG. 2A of Tanioka, Tanioka discloses a packaged semiconductor die (17) having a top surface and attached to the package module of equal height. However, the drawing reproduced in the Office Action fails to accurately indicate the proper alignment of the top surface of the semiconductor (17) and the unpackaged semiconductor (2). A corrected drawing of FIG. 2A showing the top surfaces is provided at the end of this response. Additionally, as illustrated in FIG. 2A attached at the end of this response, the top sides of the unpackaged semiconductor (2) and of the packaged semiconductor (17) are not of equal distance from the package module.

Applicants submit that Tanioka is directed to a multichip module having wiring layers on front and back surfaces. (Col. 3, lines 54-57.) A carrier board 3 disposed at the back surface of the multi chip module includes pads for external connection. (Col. 3, line 67 - Col. 4, line 11.) By changing the pad arrangement to a matrix arrangement, the spacing between the external

connection terminals reduces solder flowing between pads, thus increasing yield. (C l. 5, lines 33-37.) A silicon layer 9 is interposed between the MCM board 1 and the carrier board 3 to enable cooling of the bare chip. (Col. 5, lines 9-10; Col. 5, lines 41-43.)

Independent Claim 56

Independent claim 56 recites, among other features, "... the ... unpackaged semiconductor die encapsulated onto the package module in a structure having a planar top surface; and a packaged semiconductor die having a top surface and attached to the package module; wherein the planar top surface of the encapsulated structure and the top surface of the packaged semiconductor die are of equal distance from the substrate."

According to the Office Action dated October 24, 2003, "Tanioka clearly shows in FIG. 2A the planar top surface of the encapsulated structure (2) and the top surface of the packaged semiconductor die (17) are of equal distance from the substrate (look at the line A)". However, with regard to the assertion in the Office Action that the planar top surface of the encapsulated structure are of equal distance from the substrate, a careful examination of the line A drawn in the Office Action with respect to FIG. 2A does not appear to be properly aligned with both the top surfaces of the packaged semiconductor dies (17) and the encapsulated structure (2). Rather, Applicants submit the attached drawing at the end of this response shows more accurately drawn lines from the top surface of encapsulated structure (2) and the top surfaces of the packaged semiconductor dies (17) as shown on the left side of FIG. 2A and the right side of FIG. 2A. The lines provided in the revised drawing clearly show that the planar top surface of the encapsulated structure (2) and the top surface of the packaged semiconductor die (17) are not of equal distance from the substrate. In contrast, the line A in the drawing of FIG. 2A in the Office Action fails to be properly aligned with the top surface of the encapsulated structure (2). Clearly, Tanioka never contemplated the planar top surface of the encapsulated

structure (2) and the top surface of the packaged semiconductor die (17) are of equal distance from the substrate.

The Office Action asserts that FIGS. 2A–2C of Tanioka describe the elements of Claim 1. Firstly, according to FIG. 2A in Tanioka, small outline package 17 on both the left and to the right is shown to rise to a height that is less than the height of a neighboring package module 2. This is unlike Applicants' claimed subject matter reciting, inter alia, an "encapsulated . . . structure having a planar top surface . . . wherein the planar top surface of the encapsulated structure and the top surface of the packaged semiconductor die are of equal distance from the substrate. (Claim 56.)

Applicants submit that the encapsulation design of Tanioka lacks the advantages present in Applicants' claimed subject matter. For example, Applicants' planar top surface of an encapsulation structure is positioned in a coplanar fashion relative to the top portion of a neighboring package module, such that a heat sink having a planar bottom (e.g., a simple universal design) can be placed on top of both the top surface of the encapsulation structure and on the top portion of a neighboring package module. As a result, the heat sink in this configuration is in contact with both items and rests upon a relatively large portion of both items where the large contact, between both the encapsulation structure and the neighboring package module and the heat sink, allow for significant heat transfer from both items to the heat sink. In contrast, the encapsulation design disclosed in Tanioka is less desirable than Applicants' claimed subject matter because, rather than dissipate heat with a heat sink, Tanioka applies a silicon layer to enable cooling of the bare chip. Further, when a heat sink having a planar surface is placed on top of both the packaged and encapsulated semiconductor dies having different heights, such a heat sink then assumes an angled position across the two items. In such a position, the heat sink

only contacts the edge of the packaged heat sink and only a point of the dome, i.e., as shown in FIGS. 1, 3 in Tanioka of the encapsulated material. As such, the resulting heat transference is relatively small and the physical connection to the heat sink is positioned on an undesirable angle resulting in a number of disadvantages. It should be also noted that, regardless of the height of the top surface of the domed shaped encapsulated structure, any heat sink with a planar surface in contact with devices of different heights only shares a small contact position therewith, and as such, will result in a relatively poor transference of heat there between.

Additionally, Tanioka teaches a silicon layer 9 interposed between the MCM board 1 and the carrier board 3 to enable cooling of the bare chip (§ 5, lines 9–10; § 5 lines 41–43.) Since Tanioka teaches cooling of the bare chip with the silicon layer 9, Tanioka teaches away from contacting a coplanar heat sink surface and therefore teaches away from a planar top surface of an encapsulation structure positioned in a coplanar fashion with the neighboring package module. Since Tanioka teaches a totally different and less effective form of heat dissipation, the solution taught by Tanioka is unsatisfactory and therefore teaches away from the claims.

Applicants submit that the encapsulation design of Tanioka lacks these and other advantages present in Applicants' claimed subject matter. Another example of such an advantage includes the fact that Applicants' metal cap encapsulation technique provides the advantages associated with the properties of metallic structures generally and, more specifically, for some embodiments, the presence of a gap between the enclosed die and surrounding metal cap structure itself. In contrast, the silicon layer 9 interposed between the carrier board 3 and the MCM board 1, as taught by Tanioka, is less desirable than Applicants' claimed subject matter since the silicon layer does not dissipate heat as does a heat sink and, therefore, does not provide

the properties, such as heat transfer, provided by Applicants' claimed subject matter, nor is such material a metal cap as acknowledged in the Office Action.

Applicants submit that nowhere does Tanioka teach the claim limitation "wherein the planar top surface of the encapsulated structure and the top surface of the packaged semiconductor die are of equal distance from the substrate." Because Applicants can identify no language in Tanioka as cited that makes reference to the height of the packages, and because Tanioka teaches mounting a carrier board 3 directly to the package modules rather than a heat sink, and, further, because FIG. 2 as cited shows the small outline package 17 shown rises to a height that is less than the height of a neighboring package module 2, Applicants submit that Tanioka does not disclose Applicants' claimed subject matter, but further teaches against Applicants' invention. As such, it is respectfully submitted that claim 56 is allowable as written.

Consequently, Applicants submit that Tanioka does not disclose, teach or suggest claim 56's language including, inter alia, "... an ... unpackaged semiconductor die encapsulated onto the package module in a structure having a planar top surface; and a packaged semiconductor die having a top surface and attached to the package module; wherein the planar top surface of the encapsulated structure and the top surface of the packaged semiconductor die are of equal distance from the substrate." Nor does Tanioka disclose, teach or suggest the subject matter of claim 56 as a whole. Applicants submit that at least for the reasons that Tanioka discloses an encapsulated structure covered by a carrier board 3 where such structure is shown as being located at a position having a height different than of a neighboring package module, independent claim 56 is neither anticipated, nor is obvious in view of Tanioka.

Independent Claim 57

Independent claim 57 recites, among other features, "... a ... graphics-processing die encapsulated on the package module in a structure having a planar top surface; and a packaged memory die having a top surface and attached to the package module; wherein the planar top surface of the encapsulated structure and the top surface of the packaged memory die are of equal distance from the substrate."

Applicants respectfully reassert the arguments made above regarding the failure of Tanioka to teach the planar top surface of the encapsulated structure and the top surface of the packaged memory die are of equal distance from the substrate. Further, Applicants submit that, Tanioka does not disclose, teach or suggest, claim 57's language including, inter alia, "... a ... graphics-processing die encapsulated on the package module in a structure having a planar top surface; and a packaged memory die having a top surface and attached to the package module; wherein the planar top surface of the encapsulated structure and the top surface of the packaged memory die are of equal distance from the substrate," nor does Tanioka disclose, teach or suggest the subject matter of claim 57 as a whole. Applicants submit that at least for the reasons that Tanioka discloses an encapsulated structure covered by a carrier board 3, where such structure is shown as being located at a position having a height different than of a neighboring package module, that independent claim 57 is neither anticipated, nor is obvious in view of Tanioka.

The Office Action dated October 24, 2003, asserts that the semiconductor module "sized to be interchangeable with standard package sizes" employs intended use language. Further, the Office Action states that the argument previously presented "is not persuasive since Tanioka's packaged module is capable of performing the intended use language, Tanioka meets the claim."

However, the assertion and the standard established in the Office Action is not consistent with the standard established by the Federal Circuit.¹ "The court stated that the phrase 'so dimensioned' is as accurate as the subject matter permits, noting that the patent law does not require that all possible links corresponding to the spaces in hundreds of different automobiles be listed in the patent, let alone they be listed in the claims." Accordingly, since the language "so dimensioned" in the case is analogous to claim 57, the claim language "a package module sized to be interchangeable with standard package sizes" (see M.P.E.P. 2173(b)), the language in claim 57 is sufficiently accurate, and therefore, the rejection is improper.

Independent Claim 58

Independent claim 58 recites, among other features, an unpackaged semiconductor die . . . encapsulated in a structure having a planar top surface; and a packaged semiconductor die having a top surface and mounted on the first surface of the substrate; wherein the planar top surface of the encapsulated structure and the top surface of the packaged semiconductor die are of equal distance from the substrate.

Applicants respectfully reassert the arguments made above regarding Tanioka. Further, Applicants submit that Tanioka does not disclose, teach or suggest, claim 58's language including, inter alia, "... an unpackaged semiconductor die . . . encapsulated in a structure having a planar top surface; and a packaged semiconductor die having a top surface and mounted on the first surface of the substrate; wherein the planar top surface of the encapsulated structure and the top surface of the packaged semiconductor die are of equal distance from the substrate," nor does Tanioka disclose, teach or suggest the subject matter of claim 58 as a whole. Applicants submit that, at least for the reasons that Tanioka as cited discloses an encapsulated

¹ *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1 U.S.P.Q.2d 1081 (Fed. Cir. 1986), see also M.P.E.P. 2173.05(b).

structure covered by a carrier board 3 where such structure is shown as being located at a position having a height different from that of a neighboring package module, Tanioka teaches away from the claims. Therefore, independent claim 58 is neither anticipated nor obvious in view of Tanioka.

Dependent Claims 3 and 4

Applicants respectfully reassert the arguments made above regarding the above claims. In addition, Applicants also submit that because claims 3 and 4 depend from Claim 56 and, as dependent claims therefrom, claims 3 and 4 are allowable for at least the reasons Claim 56 is allowable. As acknowledged in the Office Action, nowhere does Tanioka disclose, teach or suggest wherein the unpackaged semiconductor die is a graphics-processor, or where the packaged semiconductor is a memory. As such, Tanioka does not disclose, teach or suggest Applicants' claimed subject matter. Applicants further submit, argued in part at least immediately above, that claims 3 and 4 are also allowable in light of the presence of novel and non-obvious elements contained in claims 3 and 4 that are not otherwise present in claim 56. Additionally, pursuant to M.P.E.P. 2144.03, Applicants respectfully challenge the assertion that Tanioka "encompasses all well known semiconductor dies including a 'memory die'" as asserted with respect to each and every element as arranged in claims 3 and 4 and request that supporting reference be cited for each element of these claims if the rejection is maintained.

Dependent Claims 5 and 6

Applicants respectfully reassert the arguments made above regarding the above claims. In addition, Applicants also submit that, because claims 5 and 6 depend from claim 56, and as a dependent claim therefrom, claims 5 and 6 are allowable for at least the reasons claim 56 is allowable. Applicants further submit, argued in part at least immediately above, that claims 5 and

6 are also allowable in light of the presence of novel and non-obvious elements contained in claims 5 and 6 that are not otherwise present in claim 56.

Dependent Claims 8 and 20

Applicants respectfully reassert the arguments made above regarding claims 56 and 57, respectively. In addition, Applicants also submit that, because claims 8 and 20 depend from claims 56 and 57 respectively and, as a dependent claim therefrom, claims 8 and 20 are allowable for at least the reasons claims 56 and 57 are allowable. Applicants further submit, argued in part at least immediate above, that claims 8 and 20 are also allowable in light of the presence of novel and non-obvious elements contained in claims 8 and 20 that are not otherwise present in claims 56 and 57. Although the Examiner asserts that the burden of proof is on the Applicants, the burden of proof for establishing a prima facie case of anticipation and obviousness rests on the Examiner, not on the Applicants.² Since the Examiner has not established a prima facie case of anticipation or obviousness, the rejections are improper.

Dependent Claim 9

Applicants submit that Tanioka does not disclose, teach or suggest, either explicitly or implicitly, Applicants' claim, inter alia, wherein the encapsulated structure has a footprint greater than the footprint of the unpackaged semiconductor die. (Claim 9). As such, Applicants respectfully submit that Tanioka does not disclose, teach or suggest Applicants' claimed subject matter of claim 9.

Dependent Claims 17 and 18

Applicants respectfully reassert the arguments made above regarding claim 57. In addition, Applicants also submit that, because claims 17 and 18 depend from claim 57 and,

² See M.P.E.P. §2142 and case citations therein.

therefore, dependent claims 17 and 18 are allowable for at least the reasons claim 57 is allowable. Applicants further submit, argued in part at least immediately above, that claims 17 and 18 are also allowable in light of the presence of novel and non-obvious elements contained in claims 17 and 18 that are not otherwise present in claim 57.

Dependent Claims 44, 45, 46, 47, 53 and 54

Applicants respectfully reassert the arguments made above regarding claim 58. In addition, Applicants also submit that, because claims 44, 45, 46, 47, 53, and 54 depend from claim 58, and, therefore, dependent claims 44, 45, 46, 47, 53, and 54 are allowable for at least the reasons claim 58 is allowable. Applicants further submit, argued in part at least immediately above, that claims 44, 45, 46, 47, 53, and 54 are also allowable in light of the presence of novel and non-obvious elements contained in claims 44, 45, 46, 47, 53, and 54 that are not otherwise present in claim 58.

Claim rejection 35 U.S.C. 103

Claims 2, 16, and 45

Claims 2, 16, and 45 are rejected under 35 U.S.C. 103(a) under Tanioka in view of Fallon, et al.

It is well-established that to establish *prima facie* obviousness, all the Claim limitations must be taught or suggested by the prior art. In addition, there must be some teaching, motivation or suggestion, in either the prior art or the references themselves, to make the combination asserted by the Examiner. In reviewing the Office Action, the Examiner asserts "it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Tanioka by using a ball grid array package for the packaged semiconductor as taught by Fallon, et al. The ordinary artisan would have been motivated to modify Tanioka in the manner described above for at least the purpose of increasing a bond strength between the

packaged semiconductor and the substrate." Contrary to the assertion of the Office Action that the ball grid array package would increase the bond strength between the packaged semiconductor and the substrate, Fallon describes the use of bond wire (868), such as aluminum, "extends between each wire bond pad of the chip and a corresponding wire bond pad (870) on coupling surface (872) of the attachment substrate (874)." (Fallon, et al. ¶37, lines 59-64). "Connectors (878) are located on the bottom surface of the carriers or modules of the invention."

Id. Accordingly, the assertion that the ball grid array increases the bond strength between the packaged semiconductor and the substrate is contrary to the teachings of Fallon, which instead teaches the use of bond wire (868).

Further, the Office Action provides no support for the assertion that the use of a ball grid array package could be used for "increasing a bond strength between the packaged semiconductor and the substrate." Additionally, the Office Action fails to describe relative to what the ball grid array increases the bond strength with, i.e., does the ball grid array increase bond strength relative to bond wires? If so, no support for such an assertion is provided and, therefore, the office action fails to establish a prima facie case of obviousness.

Measuring a claimed invention against the standard established in §103 requires the difficult but critical step of casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references in the then-accepted wisdom in the field.³ Close adherence to this methodology is especially important in the case of less technologically complex inventions, where the very ease with which the

³ *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983).

invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher."⁴

Case law makes it clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references.⁵ Combining prior art references without evidence of such a suggestion, teaching or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability – the essence of hindsight.⁶ Evidence of a suggestion, teaching or motivation to combine may flow from the prior art references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved, although "the suggestion more often comes from the teachings of the pertinent references."⁷ ("The Board must identify specifically . . . the reasons one of ordinary skill in the art would have been motivated to select the references and combine them").

The showing of such suggestion, teaching, or motivation must be clear and particular.⁸ Broad conclusory statements regarding the teaching of multiple references, standing alone, are not "evidence."⁹ As previously stated, the Office Action asserts that it would have been obvious

⁴ *Id.*

⁵ *In re Dembiczak*, 50 U.S.P.Q.2d 164, 167 (Fed. Cir. 1999).

⁶ *Id.*; see, e.g., *Interconnect Planning Corp. v. File*, 774 F.2d 1132, 1138, 227 U.S.P.Q. 543, 547 (Fed. Cir. 1985).

⁷ *Dembiczak*, 50 U.S.P.Q.2d 164, 167 (Fed. Cir. 1999); *In re Roffet*, 149 F.3d 1350, 1359, 47 USPQ 2d 1453, 1459 (Fed. Cir. 1998)

⁸ *Dembiczak*, 50 U.S.P.Q.2d 164, 167 (Fed. Cir. 1999); see, e.g., *C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, 1352, 48 U.S.P.Q.2d 1225, 1232 (Fed. Cir. 1998).

⁹ *Dembiczak*, 50 U.S.P.Q.2d 164, 167 (Fed. Cir. 1999); see, e.g., *Elmurry v. Arkansas, Power & Light Co.*, 995 F.2d 1576, 1578, 27 U.S.P.Q.2d 1129, 1131 (Fed. Cir. 1993); *In re Sichert*, 566 F.2d 1154, 1164, 196 U.S.P.Q. 207, 217 (C.C.P.A. 1977).

to one of ordinary skill in the art at the time the invention was made to modify Tanioka by using the ball grid array package for the packaged semiconductor, as taught by Fallon. With regard to the Examiner's assertion of the motivation of one skilled in the art to modify the system of Tanioka, a careful examination of Tanioka and Fallon, as cited, reveals that Fallon instead teaches the use of bond wires rather than the ball grid array asserted in the Office Action. Accordingly, taken in the proper context, Fallon teaches the avoidance of the use of a ball grid array package, but rather the use of a bond wire (868) between each wire bond pad of the chip in the corresponding wire bond pad (870) of a coupling surface (872) of an attachment substrate (874). (Fallon ¶37, lines 59–63.) Additionally, as previously stated, the Office Action has provided no support whatsoever for the assertion that the ball grid array package increases bond strength between the packaged semiconductor and the substrate. Accordingly, the Applicants challenge such an assertion, pursuant to M.P.E.P. 2144.03.

Additionally, Tanioka teaches away from the claims because, among other things, Tanioka teaches mounting a carrier board 3 directly to the package modules rather than a heat sink and, therefore, Tanioka teaches away from “wherein the planar top surface of the encapsulated structure and the top surface of the packaged semiconductor die are of equal distance from the substrate.” As stated in the response to the Office Action dated January 1, 2003, Fallon teaches an encapsulation material as only having an arc or dome shape and, therefore, also teaches against “wherein the planar top surface of the encapsulated structure and the top surface of the packaged semiconductor die are of equal distance from the substrate.” Since both Tanioka and Fallon teach against the claims, there is no motivation to combine the

references to produce the claimed invention.¹⁰ Without the presence of any such motivation to combine such references to produce Applicant's invention, the later suggestion to combine such references is impermissible hindsight and, as such, is an invalid argument for a finding of unpatentability due to obviousness.

With regard to claim 45, the Office Action asserts Tanioka discloses the semiconductor package set forth in the claims except for plurality of the unpackaged semiconductor die mounted on the first surface of the substrate. The Office Action also asserts that one would be motivated to modify Tanioka in the manner described for at least the purpose of increasing power and speed of the module. However, the Office Action provides no support for how the power and speed of the module would be increased by mounting the unpackaged semiconductor die on the first surface of the substrate. As previously stated, a broad conclusory statement standing alone is not evidence of motivation to combine. The Office Action merely has used the claims as a guide map to provide the motivation for the combination of Tanioka with Fallon. As a result, the Office Action fails to establish a prima facie case of obviousness.

Claims 3, 4, 17, 18, 20, 53, 54 and 57

Claims 3, 4, 17, 18, 20, 53, 54 and 57 are rejected under 35 U.S.C. §103(a) based on Tanioka in view of Hannah. Applicants respectfully reassert the arguments made above. In addition, Applicants also submit that these claims are allowable for at least the reason the independent claims are allowable. Applicants further submit, argued in part at least immediately above, that these claims are allowable in light of the presence of novel and non-obvious elements. The Office Action asserts that the ordinary artisan would have been motivated to

¹⁰ A prior art reference must be considered in its entirety, i.e., as a whole including portions that would lead away from the claimed invention. (*W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 U.S.P.Q. 303 (Fed. Cir. 1983). See M.P.E.P. §2141.02.

modify Tanioka in the manner described above for at least the purpose of receiving commands and graphics data from the main CPU of the computer. Without the presence of any such motivation to combine such references to produce Applicant's invention, the asserted suggestion to combine the references is impermissible hindsight and, as such, is an invalid argument for finding of unpatentability due to obviousness.

With regard to claims 4 and 5, the Office Action states that the ordinary artisan would have been motivated to modify Tanioka in the manner described above for at least the purpose of decreasing cost. However, the Office Action does not show how using the semiconductor die to be a memory decreases cost.

Claims 11 and 23

Claims 11 and 23 are rejected under 35 U.S.C. § 103(a) under Tanioka in view of Takano, et al. Applicants respectfully reassert the arguments made above regarding claims 56 and 57. In addition, Applicants also submit that because claims 11 and 23 depend from claims 56 and 57, respectively, and as a dependent claim therefrom, claims 11 and 23 are allowable for at least the reasons claims 56 and 57 are allowable. Applicants further submit, argued in part at least immediately above, that claims 11 and 23 are also allowable in light of the presence of novel and non-obvious elements contained in claims 11 and 23 that are not otherwise present in claims 56 and 57.

Independent Claim 59

Claim 59 is rejected under 35 U.S.C. § 103(a) under Tanioka in view of DiStefano. Independent claim 59 recites, among other features, "an unpackaged semiconductor die . . . encapsulated in a structure; and a packaged semiconductor die mounted on the first surface of the substrate wherein the encapsulating structure is further comprised of an encapsulating material of a metal cap." Applicants submit that neither Tanioka nor DiStefano, either in combination nor

individually, disclose, teach or suggest, claim 59's language including, inter alia, "... an unpackaged semiconductor die ... encapsulated in a structure; and a packaged semiconductor die mounted on the first surface of the substrate wherein the encapsulating structure is further comprised of an encapsulating material of a metal cap." Further, Tanioka and DiStefano, either in combination or individually, fail to disclose, teach or suggest the subject matter of claim 59 as a whole.

The Office Action acknowledges that "Tanioka does not disclose the encapsulating structure being further comprised of an encapsulating material of a metal cap." Additionally, DiStefano, as cited, requires that the cap 20 include "a pair of flanges 26 projecting outwardly from flanges 24 at the forward edges thereof, remote from rear wall 22." Such flanges on the metal cap of the encapsulating material would impermissibly interfere with the unpackaged semiconductor and, therefore, increase the surface area of the module. As a result, the suggestion to modify Tanioka with DiStefano would impermissibly change the principle of operation of Tanioka.¹¹ Additionally, the proposed modification or combination of the Tanioka reference would render the operation of Tanioka unsatisfactory for its intended purpose, and therefore the teachings of the reference are not sufficient to render the claims *prima facie* obvious.¹² Applicants submit that, at least for the reasons above, the combination of Tanioka and DiStefano are improper and, therefore, the Office Action fails to establish a *prima facie* case of obviousness for independent claim 59.

¹¹ If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 U.S.P.Q. 349 (C.C.P.A. 1959); see M.P.E.P. 2143.01.

¹² If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 200, 221 U.S.P.Q. 1125 (Fed. Cir. 1984); M.P.E.P. 2143.02.

The Commissioner is hereby authorized to charge any underpayment or credit any overpayment to Deposit Account No. 50-0441 or any payment in connection with this communication which may be required.

Applicants respectfully submit that the claims are in condition for allowance. The Examiner is invited to contact the below-listed attorney if the Examiner believes that a telephone conference will advance the prosecution of this application.

Respectfully submitted,

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